

INSTRUCTIONS-PARTS LIST

This manual contains **IMPORTANT**
INSTRUCTIONS and **WARNINGS**.
READ AND RETAIN FOR REFERENCE.



308-036

Rev E
Supersedes D

FLUID COMMANDER Electronic Dispensing Control

120 VAC, 60 Hz, 0.25 Amps

Measured in Gallons/Quarts/Pints

Dispensing Control

Model 223-731

1 Fluid to 12 Stations

Model 223-732

2 Fluids to 6 Stations

Model 223-733

3 Fluids to 4 Stations

Fluid Pulse Meter

Model 223-645

Pressure Relief Kit

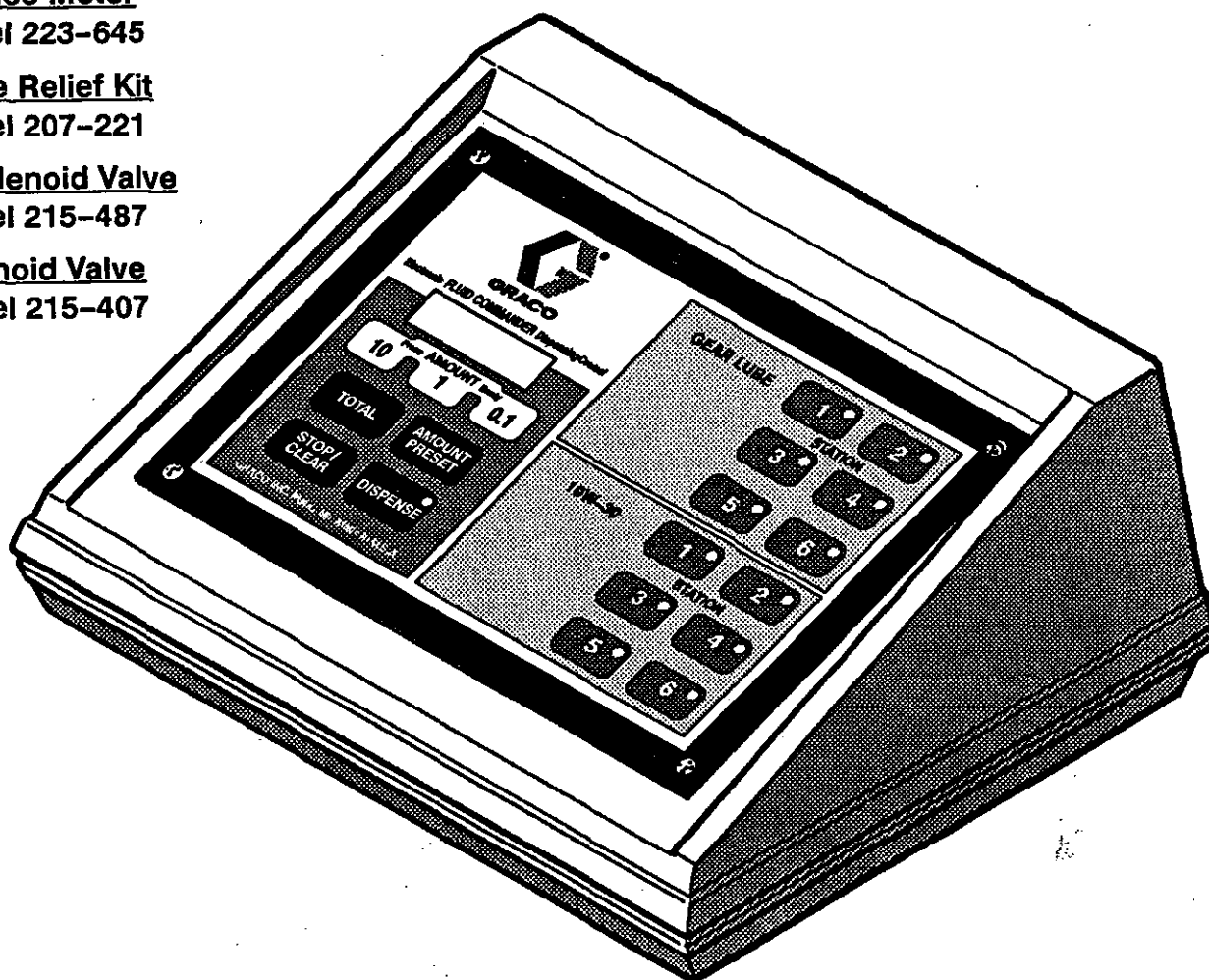
Model 207-221

Fluid Solenoid Valve

Model 215-487

Air Solenoid Valve

Model 215-407



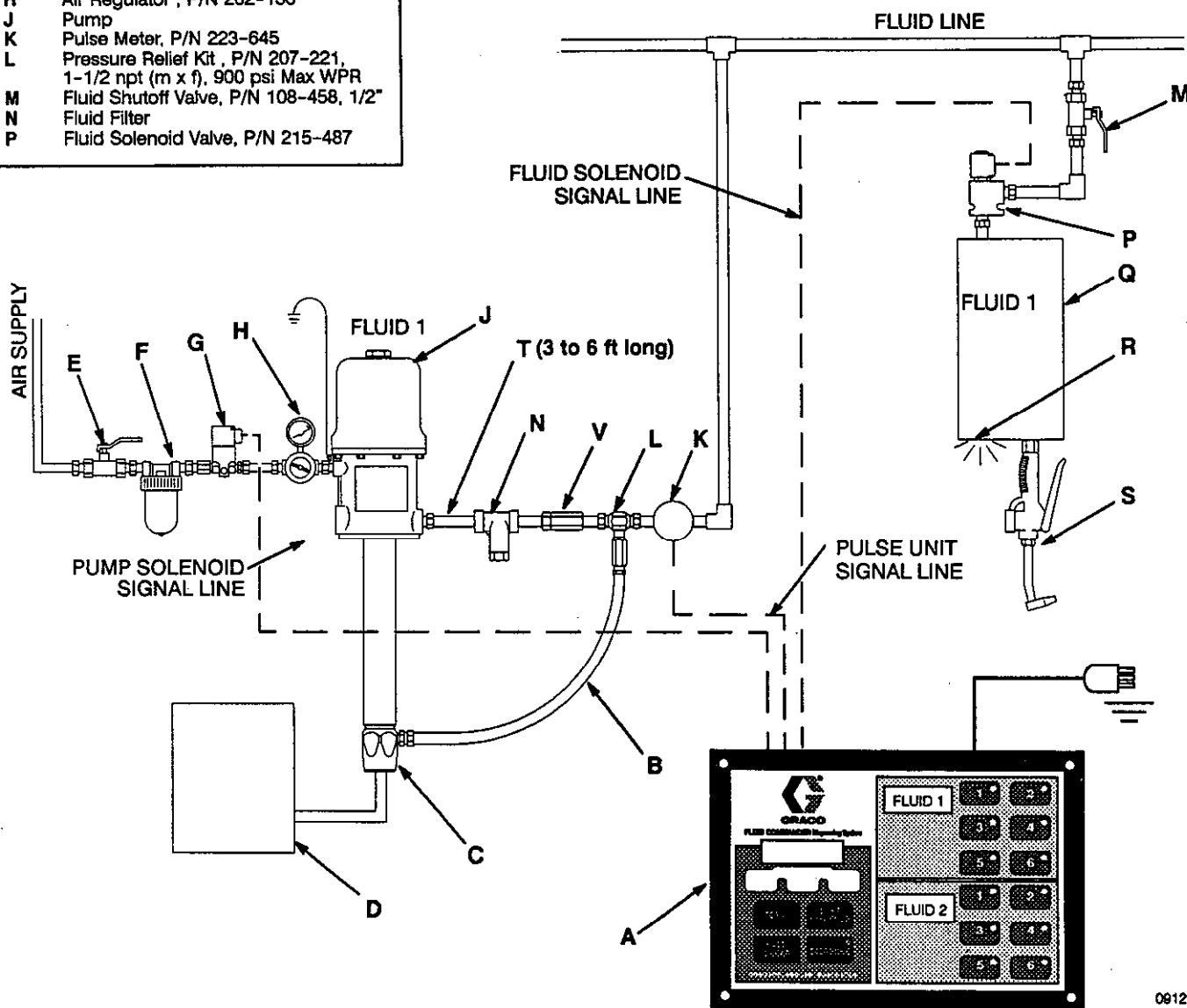
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TYPICAL INSTALLATION

KEY

A	Dispensing Control	Q	Hose Reel
B	Drain Back Tube	R	Ready Light
C	Pump Intake Valve	S	Dispense Valve
D	Supply Tank	T	Flexible Hose (3 to 6 ft long)
E	Air Shutoff Valve, Bleed type	V	Check Valve
F	Air Filter		
G	Air Solenoid Valve, P/N 215-407		
H	Air Regulator, P/N 202-156		
J	Pump		
K	Pulse Meter, P/N 223-645		
L	Pressure Relief Kit, P/N 207-221, 1-1/2 npt (m x f), 900 psi Max WPR		
M	Fluid Shutoff Valve, P/N 108-458, 1/2"		
N	Fluid Filter		
P	Fluid Solenoid Valve, P/N 215-487		



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How the Fluid Commander system works

The operator programs the control unit by selecting the appropriate fluid and station and then setting the quantity to be dispensed. When the DISPENSE key is depressed by the operator, the control unit energizes the respective air and fluid solenoid valves. As the fluid is dispensed by the service person, the pulse unit sends pulses to the control unit in proportion to the amount flowing through it. When the number of pulses counted by the control unit is equivalent to the preset quantity, the air and fluid solenoid valves shut off. Refer to OPERATION for more detailed information on using the system.

About the Typical Installation

The TYPICAL INSTALLATION is only a guideline for a basic system, showing just one fluid. Your Graco sales representative can help you design a system to suit your needs.

WARNING

A Pressure Relief Kit is required in your system to reduce the risk of serious bodily injury such as splashing fluid in the eyes or on the skin, which can occur if excessive system pressure ruptures the lines and components. Install the kit as shown in the Typical Installation Drawing. Order Graco Part No. 207-221. See page 7.

INSTALLATION

WARNING

Be sure that all accessory items and system components can withstand the pressures developed. The maximum fluid working pressure of the Fluid Commander System is 750 psi (52 bar). **NEVER** exceed the maximum working pressure of the lowest rated accessory (valve, pipe, fitting, hose, etc.) in your system.

Mount the Fluid Commander

The Fluid Commander can be placed on a desktop or mounted on a wall using the accessory wall bracket, part no. 186-472. See Fig 1.

WARNING

To reduce the risk of serious bodily injury including electric shock, the Fluid Commander must be installed and wired by a qualified electrician, following all local, State and National codes.

Electrical wiring

Have a qualified electrician install and wire the system.

Use 18 AWG wire for the entire system, up to 300 feet. For longer lengths, contact Graco Technical Assistance.

Fig 3 on page 4 shows where the wires connect at the rear of the control, depending on the number of fluids you are using.

Fig 2 shows how to make the electrical connections.

CAUTION

To ensure correct polarity of the electrical supply, use only GRACO power supply cord 111-262. Any other power supply cord may permanently damage the control.

Apply labels to control

After determining the fluids to be served by each control, apply the appropriate labels within the raised area next to the station pads. See Fig 4, page 5.

To clean the control

Spray mild household cleaner (only) on a soft cloth and wipe the unit clean. Do not allow the cleaner or any other fluid to seep under the front panel.

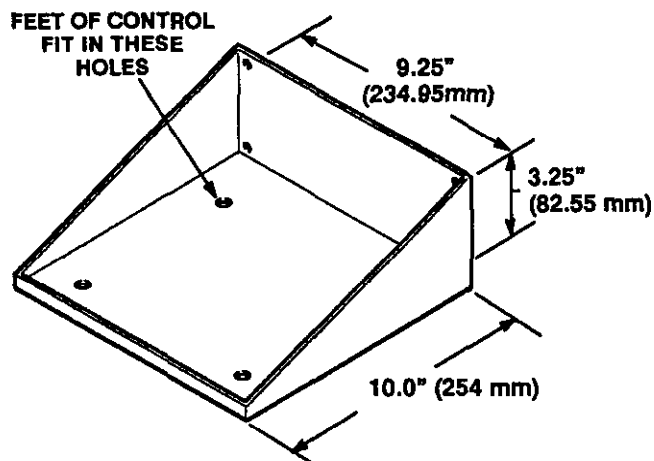


Fig 1

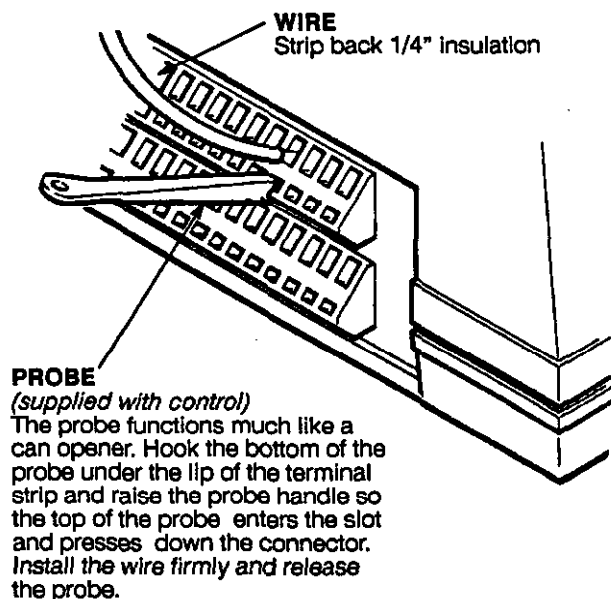


Fig 2

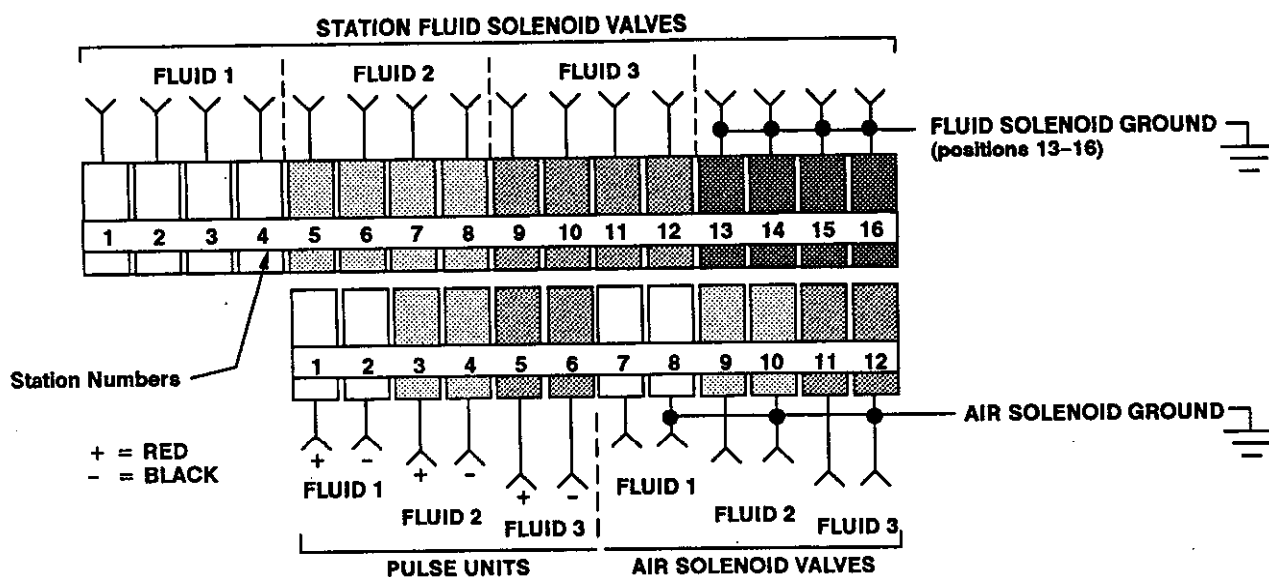
MAINTENANCE

This control is not user-repairable. If it is not working properly, return it to your Graco distributor for repair. DO NOT open the control or attempt to make any repairs yourself.

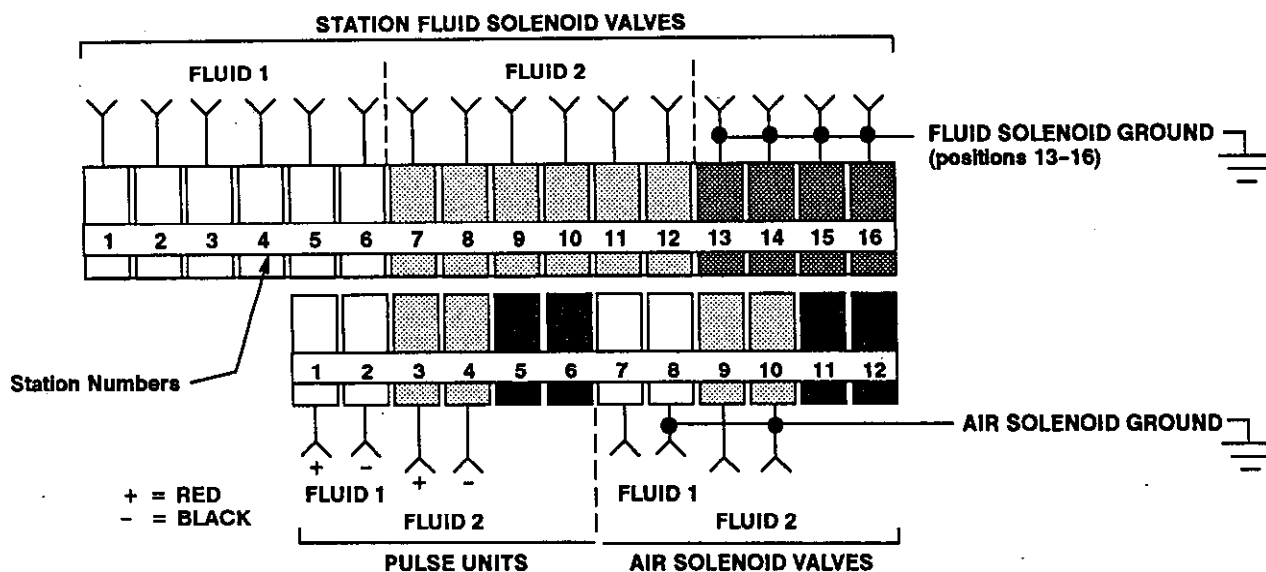
WARNING

To reduce the risk of electric shock, turn off the control and disconnect the power supply cord from the outlet before checking for loose or shorted wires, and before servicing the meters, or solenoid valves.

THREE FLUIDS TO FOUR STATIONS



TWO FLUIDS TO SIX STATIONS



ONE FLUIDS TO TWELVE STATIONS

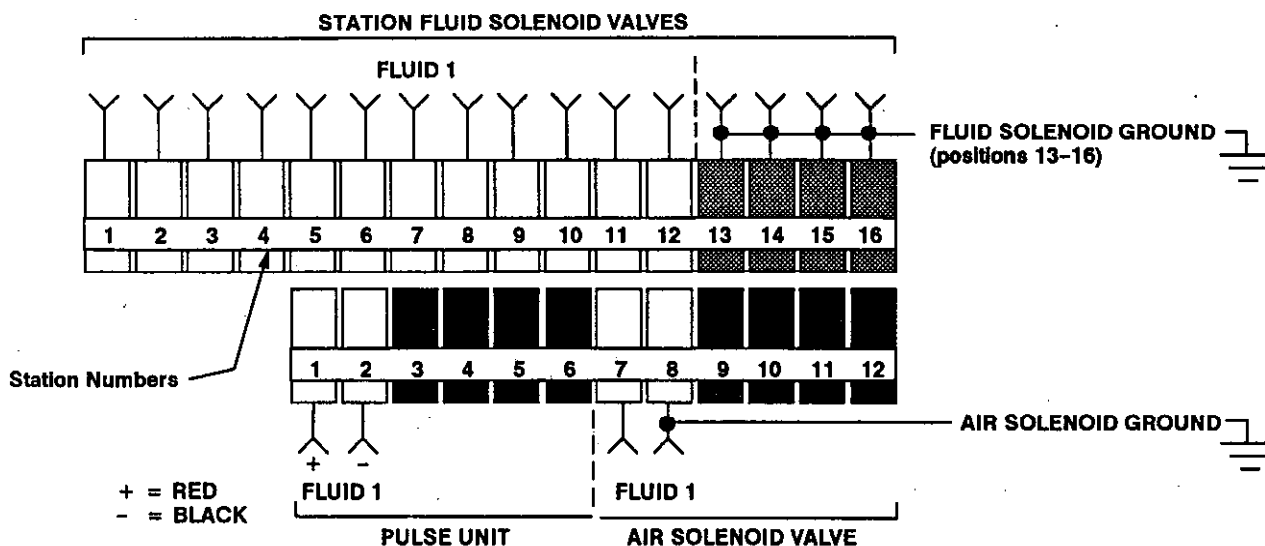


Fig 3

OPERATION

1. Program the security code and set the units of measurement

A four digit security code is required to activate the control after turning it on. This prevents unauthorized use of the system.

The control is factory-set to dispense in quarts. Refer to the instructions on the last page of this manual to change the units of measurement, if necessary. Tear out the page and keep it in a secure place.

2. Activate the control

Turn on the switch at rear of the control. The control does a quick self-check and then the display shows four dashes. Enter your security code.

3. Enter the order

Press the station number key for the appropriate fluid. The light on the key will come on.

Press the white keys firmly to enter the amount. For example, to enter 25.4 units, press the **10** twice, the **1** five times and the **0.1** four times. If you make a mistake, press **STOP/CLEAR** and enter the total amount again.

NOTE: Holding in an amount key will cause the digit to change continually until the key is released.

Press **DISPENSE**. The digital display shows all zeros and the **DISPENSE** light blinks. As the order is dispensed, the display counts up and the fluid to the reel is shut off when the preset amount is delivered.

4. To check the preset amount during dispense

Press and hold **AMOUNT PRESET**. The order continues to be delivered unless you stop or clear it.

5. To stop the dispense and check the preset amount

Press **STOP/CLEAR** and then press and hold **AMOUNT PRESET** to verify the original order. Press **DISPENSE** to continue the order.

6. To stop or clear an order

Press **STOP/CLEAR** twice to cancel and clear the order.

NOTE: This control delivers just one fluid to one station at a time. During delivery, all pads on the control are inactivated except **AMOUNT PRESET** and **STOP/CLEAR**.

7. To find the total units delivered for each fluid

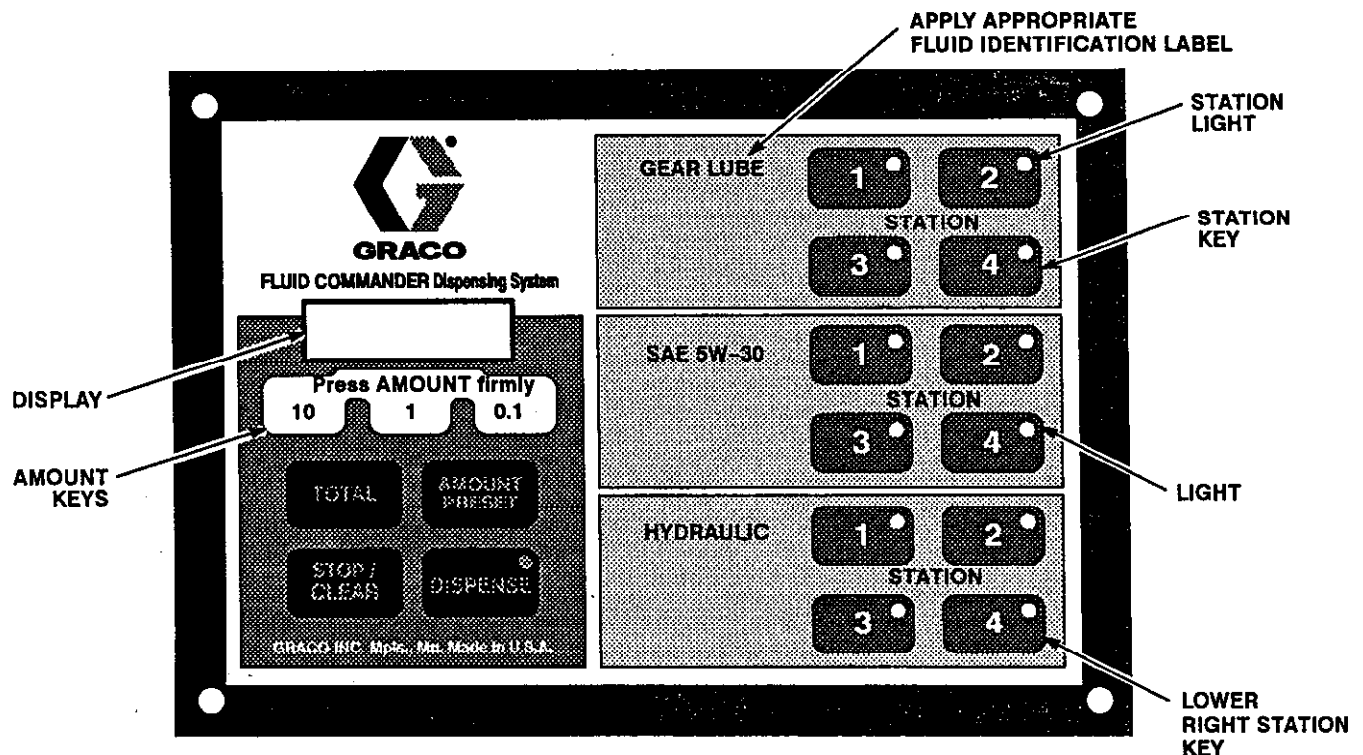
Press any station key for one fluid. Press and hold **TOTAL** to read the amount. Repeat for the other fluids.

8. If power is cut off

Each control has a built-in backup battery for its memory. When power is restored, reactivate the control by entering the security code. The total amounts dispensed will still be in the memory. If power was cut off during a dispense cycle, the control will show the fluid, station and amount already dispensed. Just press **DISPENSE** to continue.

The ON/OFF switch is also a 1.0 Amp circuit breaker. If the system shuts off unexpectedly, switch it off and on again. If the problem continues, first determine if it is caused by problems with the hard wiring. If the problem seems to be with the control, return it to Graco for repair.

NOTE: This control is not user repairable.



KEYPAD FOR THREE FLUIDS TO FOUR STATIONS

ACCESSORIES

PULSE METER 223-645

For Gallon/Quart Pint

CAUTION

To avoid damaging the electronic components of the pulse meter control (1) :

1. Do not lay anything on the electronic control.
 2. Be sure the open side of the electronic control faces up if you lay it down.
 3. Do not twist or force parts. Align parts properly as instructed.
1. Shut off the power to the pump(s) and relieve fluid pressure.
 2. Remove the screws. Lift off the electronic control.
 3. Install a new metering unit (2) and/or electronic control (1). Align the notches on the underside of the electronic control with the cutaways in the top of the metering unit. Use the new screws and torque them oppositely and evenly to 10-12 in-lb (1.2-1.4 N.m).

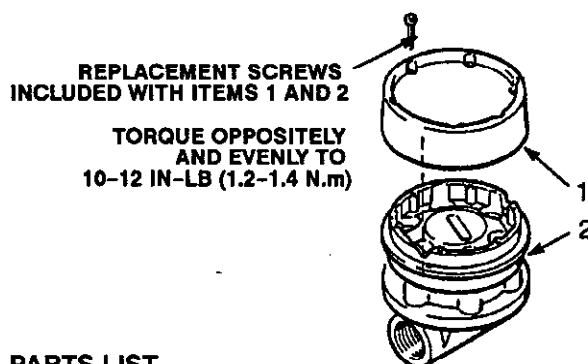
TECHNICAL DATA

Electrical

Input Voltage 15 V Maximum
Current Loop Output 4 milliamps OFF
10 milliamps ON

Hydraulic

Flow 12 gpm Maximum
(45.6 Liter/min Maximum)
Max. Operating Pressure 1500 psi (105 bar)
Inlet/Outlet 1/2 npt



PARTS LIST

1	223-655	ELECTRONIC CONTROL	1
2	222-661	METERING UNIT	1

FLUID SOLENOID VALVE 215-487

WARNING

To reduce the risk of electric shock, turn off the control and disconnect the power supply cord from the outlet before checking for loose or shorted wires, and before servicing the meters, or solenoid valves.

The solenoid valve is normally closed; foreign matter could hold the valve open, preventing it from stopping the fluid flow. If that happens, stop the pump, open the dispensing valve controlled by the solenoid valve to relieve line pressure, and close the shutoff valve ahead of the solenoid valve.

To clean the solenoid valve, unscrew the nut, remove the operator and unscrew the piston from the body. Clean the parts and the seat in the body. Blow air into the body to clear the fluid passageways.

Reassemble the valve and dispense fluid to see if the held-open condition has been corrected. If it has not, replace the solenoid valve.

NOTE: Dispense fluid at the dispensing valve controlled by the cleaned or replaced solenoid valve until all air is purged from the system.

TECHNICAL DATA

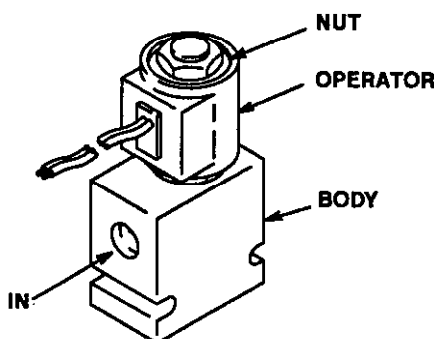
Type 2 way normally closed
Electrical Rating 28 V DC, 0.46 amp

NOTE: provides minimum current draw when operated at 24 V DC

Coil Insulation Class H
Leads 18 AWG x 18 in. long
Maximum Working Pressure ... 3000 psi (207 bar)
Inlet/Outlet 1/2 npt

Minimum Actuation Volts Required 20
Wiring Gauge Required for

Length of Run 18 AWG up to 300 ft.
16 AWG up to 500 ft.
14 AWG up to 1000 ft.



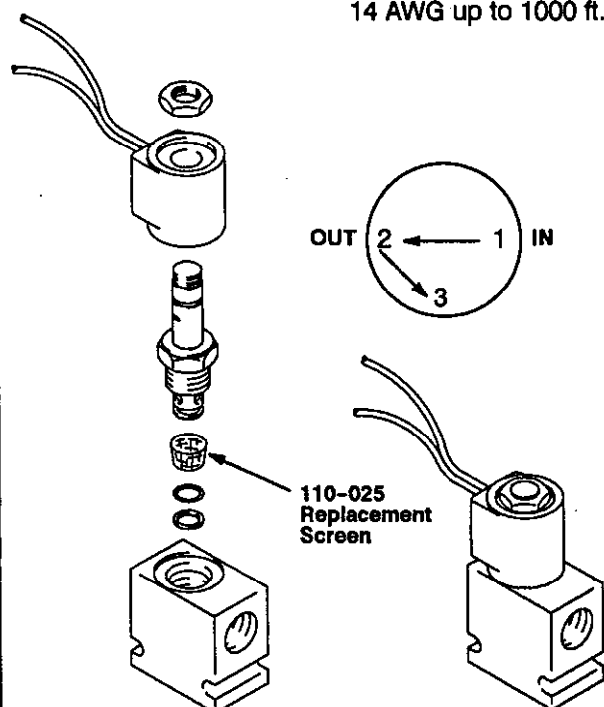
ACCESSORIES

AIR SOLENOID VALVE

215-407

TECHNICAL DATA

Type 3 way solenoid operated air valve,
normally closed
Electrical Rating 24 V DC, 0.25 amps
Coil Insulation General purpose, Class A
Encapsulated - Continuous Duty
Leads 18 AWG x 12.0 in. long
Inlet/Outlet Adapted to 1/2 npt
Wiring Gauge Required for
Length of Run 18 AWG up to 300 ft.
16 AWG up to 500 ft.
14 AWG up to 1000 ft.



FLUID CHECK VALVE

111-620

1500 psi (103 bar) MAXIMUM WORKING PRESSURE
1/2 npt(fbe)

WIRING HARNESS

224-090

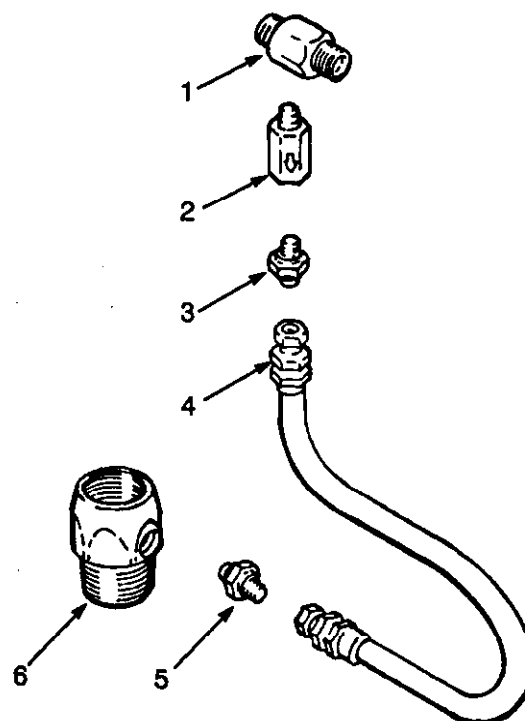
50 ft (15.2 m) long. 18 AWG, 90 V, 2 wire

PRESSURE RELIEF KIT

207-221

900 psi (62 bar) MAXIMUM WORKING PRESSURE

Relieves fluid line pressure when it exceeds 900 psi (62 bar).



PARTS LIST

1	167-453	TEE, pipe, 1/2 npt(m)	1
2	102-527	RELIEF VALVE	1
3	156-849	NIPPLE, 3/8 npt	1
4	205-169	HOSE, nylon, 3/8" ID, cpld 3/8 npsm (fbe); 3" (0.9 m) long	1
5	157-350	ADAPTER, 3/8 npt(m) x 1/4 npt(m)	1
6	167-452	ADAPTER, hose, 1-1/2" npt(mx) f	1

TECHNICAL DATA

Fluid System Maximum Operating Pressure	750 psi (52 bar)
Power Input	110/120 volt, 60 Hz
Units of Measurement	Totalizing Gallons to 19999 Dispensing 0.01 increments up to 199.99 Pints, Quarts, or Gallons
Circuit Breaker	1.0 Amp
Power Supply Cord	7.5 ft (2.3 m), 18 AWG, 3 conductor, molded vinyl plugs, 125 VAC, 10 amps
Control Module Power Output	24 VDC nominal @ 750 milliamps maximum to any (1) fluid valve and any (1) air valve simultaneously
Control Module Dimensions	Length 8 in. (203 mm) Width 10 in. (245 mm) Height 4 in. (102 mm) Weight 4 lb (1.8 kg)

SERVICE INFORMATION

This manual has been updated to add wiring gauge required lengths to the Technical Data of the Air and Fluid Solenoid valves.

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THE GRACO WARRANTY AND DISCLAIMERS

WARRANTY

Graco warrants all equipment manufactured by it and bearing its name to be free from defects in material and workmanship on the date of sale by an authorized Graco distributor to the original purchaser for use. As purchaser's sole remedy for breach of this warranty, Graco will, for a period of twelve months from the date of sale, repair or replace any part of the equipment proven defective. This warranty applies only when the equipment is installed, operated and maintained in accordance with Graco's written recommendations.

This warranty does not cover, and Graco shall not be liable for, any malfunction, damage or wear caused by faulty installation, misapplication, abrasion, corrosion, inadequate or improper maintenance, negligence, accident, tampering, or substitution of non-Graco component parts. Nor shall Graco be liable for malfunction, damage or wear caused by the incompatibility with Graco equipment of structures, accessories, equipment or materials not supplied by Graco, or the improper design, manufacture, installation, operation or maintenance of structures, accessories, equipment or materials not supplied by Graco.

This warranty is conditioned upon the prepaid return of the equipment claimed to be defective to an authorized Graco distributor for verification of the claim. If the claimed defect is verified, Graco will repair or replace free of charge any defective parts. The equipment will be returned to the original purchaser transportation prepaid. If inspection of the equipment does not disclose any defect in material or workmanship, repairs will be made at a reasonable charge, which charges may include the costs of parts, labor and transportation.

DISCLAIMERS AND LIMITATIONS

THE TERMS OF THIS WARRANTY CONSTITUTE PURCHASER'S SOLE AND EXCLUSIVE REMEDY AND ARE IN LIEU OF ANY OTHER WARRANTIES (EXPRESS OR IMPLIED), INCLUDING WARRANTY OF MERCHANTABILITY OR WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, AND OF ANY NON-CONTRACTUAL LIABILITIES, INCLUDING PRODUCT LIABILITIES, BASED ON NEGLIGENCE OR STRICT LIABILITY. EVERY FORM OF LIABILITY FOR DIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES OR LOSS IS EXPRESSLY EXCLUDED AND DENIED. IN NO CASE SHALL GRACO'S LIABILITY EXCEED THE AMOUNT OF THE PURCHASE PRICE. ANY ACTION FOR BREACH OF WARRANTY MUST BE BROUGHT WITHIN TWO (2) YEARS OF THE DATE OF SALE.

EQUIPMENT NOT COVERED BY GRACO WARRANTY

GRACO MAKES NO WARRANTY, AND DISCLAIMS ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO ACCESSORIES, EQUIPMENT, MATERIALS, OR COMPONENTS SOLD BUT NOT MANUFACTURED BY GRACO. These items sold, but not manufactured by Graco (such as electric motor, switches, hose, etc.) are subject to the warranty, if any, of their manufacturer. Graco will provide purchaser with reasonable assistance in making any claim for breach of these warranties.

IMPORTANT PHONE NUMBERS

TO PLACE AN ORDER, contact your Graco distributor, or call this number to identify the distributor closest to you: **1-800-328-0211 Toll Free**

FOR TECHNICAL ASSISTANCE, service repair information or assistance regarding the application of Graco equipment: **1-800-543-0339 Toll Free**

Factory Branches: Atlanta, Chicago, Dallas, Detroit, Los Angeles, West Caldwell (N.J.)
Subsidiary and Affiliate Companies: Canada; England; Korea; Switzerland; France; Germany; Hong Kong; Japan
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PRINTED IN U.S.A. 308-036 3-90 Revised 10-91

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PROGRAMMING SECURITY CODE AND CHANGING MEASUREMENT UNITS

For the Fluid Commander Dispensing Control

**TEAR OUT THIS SHEET ALONG THE DOTTED LINE
and keep it in a secure place after initially entering
the security code and setting the measurement units.**

TO PROGRAM YOUR SECURITY CODE

1. Turn on the control.
2. When the display shows - - - - press the following keys: **DISPENSE**, **TOTAL**, most lower right station key, and **0.1** key.
3. The display shows **P P P P**.
4. Enter any four station key numbers; this is your security code.
5. Enter the same four numbers again to activate the control.
6. Record the sequence of numbers and keep in a secure place.

TO CHANGE MEASUREMENT UNITS

(Gallon, Quart or Pint only - controls measured in liters cannot be changed)

1. Turn on the control.
2. When the display shows - - - - press the following keys: **DISPENSE**, **TOTAL**, most lower right station key, and **TOTAL**.
3. The display shows **L1** and the station lights for the first fluid glow.
4. Press the **0.1** key to change the measurement units.
5. Press any station key for the next fluid, and press the **0.1** key to change units.
6. Press **TOTAL** to end.
7. Enter your security code to activate the control.

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